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SUBJECT : REFRESHER COURSES FOR PRIVATE AND COMMERCIAL PILOTS

1. **PURPOSE.** This circular announces the availability to the public of a set of refresher courses for private and commercial pilots and for instrument rated pilots.
2. **DESCRIPTION OF THE PUBLICATION.** This publication provides a syllabus of ground instruction "periods" and training "lessons" which prescribes the minimum coverage for refresher training only.
3. **HOW TO GET THIS PUBLICATION.**
 - a. Order copies of this publication from:

Superintendent of Documents
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FAA Advisory Circular AC NO: 61-10
Refresher Courses for Private and Commercial Pilots dated 1964
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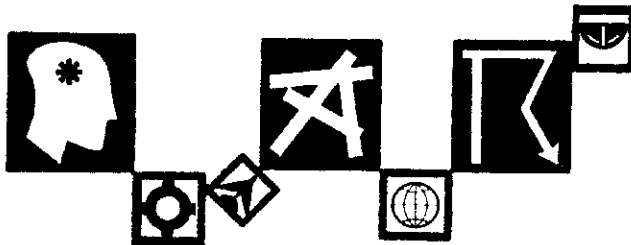

George S. Moore
Director
Flight Standards Service



AC 61-10

**PRIVATE AND
COMMERCIAL PILOTS**

Refresher Courses



FEDERAL AVIATION AGENCY

**REFRESHER COURSES
FOR
PRIVATE AND COMMERCIAL PILOTS**



1964

**FEDERAL AVIATION AGENCY
Flight Standards Service**

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PREFACE

Interest of pilots in refresher courses and special training to upgrade their piloting skills is increasing significantly. Training courses are being held at "pilot clinics" sponsored by State aeronautics commissions and national aviation organizations, and by local agencies such as flying clubs and operators' organizations. The number of pilots who are individually seeking advanced flight training is also increasing.

In response to requests for official recommendations for such training, the Flight Standards Service of the Federal Aviation Agency has developed refresher courses for pilots holding at least private pilot certificates and for pilots with instrument ratings. These refresher courses for private and commercial pilots are presented in this guide and are issued as Advisory Circular No. 61-10.

The Federal Aviation Agency encourages certificated pilots to take refresher courses and advanced training, but it does not itself sponsor such refresher courses or training clinics. However, FAA is always ready to assist in any practical way in the conduct of such events by responsible aeronautical groups. Groups or agencies interested in sponsoring advanced flight training should contact their local FAA General Aviation District Office for technical advice and full information on the assistance available from FAA.

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REFRESHER COURSES FOR PRIVATE AND COMMERCIAL PILOTS

REFRESHER COURSES OFFERED

The refresher courses outlined in this publication have been prepared for use by any agency, flight operator, or instructor who engages in the refresher training of certificated pilots. A trainee who satisfactorily completes a refresher course that meets the criteria and standards prescribed in this circular may be certified as having completed an "FAA Refresher Course." However, these courses do not constitute "approved courses" in the sense of courses offered by certificated airman agencies to qualify graduates for certification.

This Advisory Circular provides only the scope, coverage, and syllabus for recommended pilot refresher courses. It does not pretend to furnish the study material and instruction necessary for presentation. The use of authoritative texts and study guides and the presentation of good audiovisual training aids are recommended.

The ground school classes or instruction should be conducted by a certificated ground instructor holding at least a Basic Ground Instructor Rating or an Instrument Ground Instructor Rating, as appropriate to the course, or both.

The ground instruction should be given concurrently with the flight instruction, and carefully coordinated with it to avoid inconsistencies that might confuse the trainee or decrease his confidence.

SYLLABUS FOR PILOT REFRESHER COURSE

Figure 1 presents a syllabus for a refresher course for certificated pilots. It is a tabulation of the training recommended for a pilot refresher course, showing the minimum acceptable coverage, which can be expanded as much as the circumstances under which it is offered will permit. Additional instruction will be required for a trainee who does not meet current requirements for the issuance of at least a private pilot certificate.

Figure 1. Syllabus for Pilot Refresher Course.

Ground Instruction	Flight Instruction	Directed Practice*
<p style="text-align: center;"><i>Period 1</i></p> <ol style="list-style-type: none"> 1. Flight maneuvers. 2. Aircraft performance. 3. Flaps, trim, and controllable propellers. 4. Aircraft and equipment emergencies. <p style="text-align: center;"><i>Period 2</i></p> <ol style="list-style-type: none"> 1. Aircraft and pilot certificate rules. 2. General operating rules. 3. VFR traffic rules. 4. Use of NOTAMS, FIM, and Airman's Guide. <p style="text-align: center;"><i>Period 3</i></p> <ol style="list-style-type: none"> 1. Use of charts. 2. VFR radio navigation. 3. Terminal area and tower operations. 4. Flight instrument interpretation. <p style="text-align: center;"><i>Period 4</i></p> <ol style="list-style-type: none"> 1. Weather reports. 2. Weather recognition. 3. Radio assistance. 4. Radar, DME, doppler, transponders, etc. 	<p style="text-align: center;"><i>Lesson 1</i></p> <ol style="list-style-type: none"> 1. Flight maneuvers. 2. Coordination and planning exercises. 3. Takeoffs and landings. <p style="text-align: center;"><i>Lesson 2</i></p> <ol style="list-style-type: none"> 1. Short and soft field takeoffs. 2. Slow flight—stalls. 3. Crosswind takeoff and landing. 4. Emergency operations. <p style="text-align: center;"><i>Lesson 3</i></p> <ol style="list-style-type: none"> 1. Flight planning. 2. Use of compass. 3. Chart reading. 4. VFR radio navigation. 5. Control by instruments. <p style="text-align: center;"><i>Lesson 4</i></p> <p>Flight check by alternate flight instructor, or by chief instructor.</p>	<p style="text-align: center;"><i>1 hour</i></p> <p>As assigned by flight instructor.</p> <p style="text-align: center;"><i>1 hour</i></p> <p>As assigned by flight instructor.</p> <p style="text-align: center;"><i>1 hour</i></p> <p>As assigned by flight instructor.</p> <p style="text-align: center;">-----</p>

*Directed practice may be solo or with another trainee, at the discretion of the flight instructor.

Adjustment of Syllabus to Circumstances

The syllabus for the pilot refresher course prescribes the minimum coverage. It is appropriate for *refresher* training only, and does not provide for the coverage of unfamiliar operations, such as training in the control of an airplane by instruments, unless the appropriate segments of the course are expanded. For this reason, ground instruction "periods" and training "lessons" are specified in terms of the training to be covered, without reference to the time to be devoted to each.

For a currently qualified pilot, the time devoted to the items in the syllabus should be relatively uniform; while for trainees with gaps in their pilot qualifications, the coverage of some items should be expanded significantly.

This refresher syllabus may be offered at pilot training clinics of various durations. It is most unlikely that the whole course could be administered in less than 2 days; and it may be conducted effectively over a period as long as one week. For the longer course periods, it is suggested that the coverage of each subject be expanded uniformly. However, there is no objection to the addition or introduction of other subjects *provided* the course retains its basic scope, format, and coordination of ground and flight instruction.

REFRESHER GROUND INSTRUCTION

Flight Maneuvers and Aircraft Operations

Objectives and Performance of Flight Maneuvers

The flight maneuver ground instruction should be conducted by a certificated flight instructor if the ground instructor does not also hold a flight instructor certificate. The instruction should be carefully coordinated with the flight instruction conducted in the course by other instructors.

The basic flight maneuvers (straight and level, turns, climbs, and descents) and standard flight training maneuvers (turns about a point, rectangular courses, etc.) should be carefully described. The objectives of each training maneuver should be analyzed, and its relationship to earlier and subsequent maneuvers in flight training courses established. This should be done to give the trainee an awareness of the significant features of each maneuver as a basis for evaluating his own performance.

It is recommended that all flight instructors participating in the course attend this segment of the ground course, or inform themselves fully on the flight maneuvers and techniques that evoke difficulty during the ground school session. Such problems can be considered also in the flight maneuver instruction.

Aircraft Performance—Importance of "V" Speeds

This segment includes a review of the forces acting on an airplane in flight; the effects of loading, density altitude, temperature, and turbulence on airplane performance; and the importance of the angle-of-attack.

It should include an introduction of the engineers' abbreviations for the speeds most critical to airplane performance, such as V_{so} , V_{st} , V_{no} , and V_{nc} . If there are multiengine pilots among the trainees, the importance of V_{mo} should be reviewed. The determination, application, and importance of the best rate-of-climb and best angle-of-climb airspeeds should be covered thoroughly.

The markings and colored arcs on the face of the airspeed indicator should be reviewed and associated with the critical speeds considered above. When possible, the ground school period on airplane performance should be conducted with constant reference to the *Air-*

plane Flight Manuals for the airplanes used in the flight portion of the course.

Use of Trim, Flaps, and Controllable Propellers

The importance of the correct use of the trim controls to the efficient, safe use of high-performance airplanes should be emphasized. Special attention should be given to the pilot's consideration of trim settings when making an emergency pull-up from a landing approach, and when changing gear and flap settings.

A thorough review of the effects and correct usage of flaps will be found valuable, and of interest to most pilots. This should include the importance of the use of the flap settings specified in the *Airplane Flight Manual* on takeoff as well as landing approaches. The comparative effects of the three standard types of flaps (simple, split, and Fowler) on lift, drag, and stalling speed should be covered. The fact that altitude can be maintained by increasing the angle-of-attack when flaps are raised at any speed above stalling is not understood by many pilots.

The use of controllable propellers for the regulation of engine power output should be covered, as should the effect of various pitch settings with the engine idling or inoperative. The differences in manually controllable and constant speed propellers in the latter condition should be pointed out. Feathering and unfeathering procedures should be covered if there are multiengine pilots among the trainees.

Aircraft and Equipment Emergencies

This segment of the ground instruction should cover as many as possible of the common malfunctions and failures which affect aircraft and aircraft systems. Among them are fuel and hydraulic pump failures, loss of hydraulic fluid, generator failures, gear and flap system malfunctions, runaway propellers, radio failures, fire in flight, and engine malfunction or failure.

Instruction should cover means for rectifying malfunctions in flight, the use of alternate equipment such as hand pumps or auxiliary radio gear, and emergency actions in such cases as fire in flight or complete power failures. Emphasis should be placed on the careful analysis by the pilot of an unexpected malfunction, and the selection of a course of action which will permit him to proceed to a safe landing without undue hazard.

Regulations and Procedures

At least one ground instruction period should be devoted to the review of the Federal Aviation Regulations and the FAA operating procedures which apply to general aircraft operations. Copies of

Parts 61 and 91 of the Federal Aviation Regulations, or the FAA *Rules of Flight* or *Flight Information Manual and Airman's Guide* should be made available to each trainee.

The instruction should cover at least:

- a. Aircraft and pilot certificate rules.
- b. General operating rules.
- c. VFR traffic rules—cruising altitudes, right-of-way, weather minimums, communication requirements, and other items.
- d. The procurement and use of *NOTAMS*, the *Flight Information Manual*, and the *Airman's Guide*.

Cross-Country Flying

Use of Charts

The availability and use of the aeronautical charts appropriate to VFR navigation should be reviewed. The charts considered should include at least Sectional Aeronautical Charts, Low-Altitude Enroute Charts, and the new local Visual Navigation Charts. The use of these charts for plotting courses, pilotage, airport and radio facility information, topography, and obstructions should be covered.

Flight Planning

Ground school coverage of flight planning should include the selection and plotting of routes, selection of proposed and alternate stops, determination of equipment requirements, investigation of possible restricted areas, and the preparation of simple VFR flight log sheets.

VFR Radio Navigation

Ground school coverage of radio navigation should include the interpretation and use of Omni bearings and courses, and elementary tracking with ADF. Four-course, low-frequency ranges may be included at the instructor's discretion. Emphasis should be placed on the use of radio aids in conjunction with pilotage, rather than its use as the sole means of navigation in VFR conditions. Constant orientation with respect to the chart as a precaution in case of radio failure should be stressed.

Terminal Area Operations

Some of the material to be covered under this item will be new to many private pilots. It should include the use of Local Visual Navigation Charts to identify VFR check points for control tower communications and instructions; to spot obstructions, hazards, and congested areas; and for control zone and airport layouts. The use of radio for VFR traffic advisories and airport approach and departure control should be covered.

Control Tower Operations

Ground instruction on tower operations should cover the selection of the appropriate tower frequencies, the use of ground control, the filing and closing of VFR flight plans, and the emergency use of light gun signals.

Flight Instrument Interpretation

Ground instruction in the interpretation of flight instrument indications should be assisted or conducted by a flight instructor who is instructing in the refresher course, in the event the ground instructor does not hold a flight instructor certificate or instrument rating. It is recommended that all flight instructors participating in the flight portion of the refresher course attend this segment of the ground school to insure standardization of terminology and instrument usage. The indications, capabilities, and limitations of the standard gyroscopic turn indicator, attitude indicator (artificial horizon), directional gyro, magnetic compass, airspeed indicator, and altimeter should be covered.

Weather Services and Special Assistance

The ground instruction should include a thorough review of the services and facilities available to a pilot at FAA Flight Service Stations and Weather Bureau offices, and by taped telephone services and broadcasts on communication and navigation frequencies. At least the following items should be covered.

Weather Reports and Forecasts

This should include a review of the weather information available, and how each type of weather information may be obtained. It should include at least sequence reports, terminal forecasts, wind forecasts, area forecasts, and special route forecasts.

Weather Recognition

Weather recognition should be presented not only as a means of avoiding hazardous conditions within view of the pilot, but also for the establishment of the habit of constantly confirming the forecasts under which the flight was initiated. A pilot who forms the habit of continually confirming or noticing differences from forecast conditions is much less likely to be caught by unpredicted hazardous weather. For this instruction the visible characteristics of common significant weather conditions should be reviewed and associated with the forecasts which would predict them.

Radio Assistance Available in Flight

Many valuable services by radio are available in flight, if the pilot knows how to request them. The ground instruction portion of the refresher course should cover at least the following:

- (1) *Pilot-to-forecaster weather service.* Current weather reports and forecasts available directly from the forecaster by request on 122.6 mc. These are available in several FAA centers now, and the program will be expanded as rapidly as possible.
- (2) *Radar vectors.* Procedures for the use of disorientated pilots in requesting radar vectors to available landing areas.
- (3) *DF fixes.* Procedures for the use of disorientated pilots in requesting low frequency or VHF directional radio fixes from FAA facilities.
- (4) *Unicom.* The use of the two Unicom frequencies for airport information and services at both controlled and other airports. The use of 122.9 mc for inter-aircraft communications should be introduced.
- (5) *Emergency frequency.* The availability of all types of assistance from civil and military stations on 121.5.

Introduction to Radar, Transponders, Doppler, Course Directors, DME

Although some trainees may have one or more of these installed in his airplane or in an airplane with which he is familiar, they are not yet in common usage in general aviation. A short presentation of their functions, principles of operation, and limitations should be provided by an instructor or technician well informed on these devices.

REFRESHER FLIGHT INSTRUCTION

Basic Flight Maneuvers

Flight Training Maneuvers

The first flight in the Pilot Refresher Course should begin with the performance of a number of primary flight training maneuvers commonly used in elementary flight training. This will help the trainee and the instructor to get acquainted and will give the instructor an opportunity to evaluate his trainee's piloting technique. The maneuvers selected should be simple, such as turns about a point, S turns, or rectangular courses; and climbs, glides, and turns. No extensive practice or instruction should be necessary, beyond that needed to correct errors or clarify details of pilot technique which are not clearly shown by one maneuver.

Coordination and Planning Exercises

Part of the first flight lesson should be devoted to instruction and practice of coordination and planning exercises. These may vary from medium and steep turns to headings to such complicated exercises as chandelles and lazy eights. The instructor should base his selection of these exercises on the competency and deficiencies revealed during his trainee's performance of flight training maneuvers. This practice should continue until an acceptable level of coordination and planning is achieved.

Takeoffs and Landings

After an acceptable level of performance of flight training maneuvers and coordination and planning exercises has been achieved, the first flight period should be completed with a series of takeoffs and landings. These should be performed with precision, using accurate liftoff, climb, and approach speeds; maintaining an accurate traffic pattern; and complying with prescribed power and aircraft systems management.

Directed Practice

In the event further practice on some of the flight operations covered on the first lesson is needed, the instructor may direct his trainee to practice specific maneuvers of operations solo, or on a "buddy ride" with another trainee. When this is done, the trainee's

performance of the maneuvers concerned should be reevaluated by the instructor at the beginning of the second dual flight lesson.

Maximum Performance Maneuvers

The training prescribed for the second dual instruction period should not be initiated until an acceptable level of competency is achieved in the maneuvers and procedures prescribed for the first period, regardless of the flight time or number of flights required.

Short and Soft Field Takeoffs, Maximum Climbs

The instructor may, at his own discretion, require the practice of the use of maximum climbs before or after the maximum performance takeoffs prescribed. The trainee should be required to attain and hold for at least 3 minutes the best rate-of-climb airspeed published in the *Airplane Flight Manual* for the airplane used. The altitude gained per minute by the clock after the climb stabilizes should be noted, and if time permits, compared with the climb resulting from other airspeeds. The best angle-of-climb speed should be practiced in the same manner, although an accurate check of the angle-of-climb achieved cannot be accurately measured without complex equipment.

Short field takeoffs should be practiced by lifting off at just under the best angle-of-climb airspeed, and making the first 50 feet of climb at that airspeed. The recommended flap, trim, and power settings should be used.

Soft field takeoffs should be performed by lifting off the surface at the slowest possible speed, and holding the airplane just clear of the runway until the best rate-of-climb speed is attained before initiating further climb.

When performing either of these maximum performance takeoffs in a multiengine airplane, no climb shall be initiated at less than the published engine-out minimum control speed.

Slow Flight, Stall Recognition and Recovery

Slow flight should be practiced in straight flight and turns at minimum controllable airspeeds and at landing approach speeds. The smooth, prompt transition from cruising to landing approach speed while maintaining altitude and heading should be emphasized in higher performance single-engine and all multiengine airplanes.

Stall recognition and recoveries should be practiced from all normally anticipated flight situations. Although three such situations in which stalls have been found critical are specified in the *Flight Test Guides*, stall practice must not become an exercise in how to stall an airplane. Prompt stall recognition and correct recovery technique should be emphasized.

Crosswind Takeoffs and Landings

Crosswind techniques should emphasize the maintenance of a straight final approach track in line with the intended landing roll, and a straight initial climb in line with the takeoff run. Directional control on the ground, especially during the landing roll is the critical feature of this operation.

During the demonstration and practice of crosswind takeoffs and landings, the maximum crosswind component limitations of the *Airplane Flight Manual* must not be exceeded.

Emergency Operations

The emergency operations practiced during the second dual flight period should include forced landing procedures if a single-engine airplane is used, or engine-out procedures if a multiengine airplane is used, and the aircraft and equipment emergencies covered in the first ground school session.

Forced landing techniques should be practiced at some established landing area, preferably an outlying practice field, where actual landings can be accomplished safely. Right and left approaches should be made from various altitudes and positions with the engine throttled. Use of the "surprise" type of forced landing practice during other maneuvers may be made at the instructor's discretion, *provided* no simulated forced landing is given where an actual landing could not be safely effected by the instructor, or where the operation would involve a violation of the Federal Aviation Regulations.

Engine-out maneuvers in multiengine airplanes should be practiced as they are described in the *Multiengine Flight Test Guide*.

Aircraft and equipment emergency procedures should be actually performed when practicable, such as the manual extension of the gear or use of boost pumps and crossfeed. Such emergency operations as the discharge of pressure fire extinguisher systems should be described and simulated.

Directed Practice

If further practice on some of the operations covered on the first two flight periods is needed, the instructor may direct his trainee to practice specific maneuvers solo or with another trainee. Forced landing practice should be limited to situations in which an actual landing on an established landing area is intended or completely feasible.

Cross-Country Operations

No extensive cross-country flights need be undertaken in pilot refresher courses. Demonstrations should be limited to short flights on assigned courses when necessary to practice specific operations.

Training in cross-country operations should not begin until the trainee has achieved an acceptable level of performance in all operations covered during the first two dual flight periods.

Flight Planning

Flight planning should include the performance of all operations appropriate to initiating an extended cross-country flight. This will be more effective if it is coordinate with the flight planning covered in the third ground school period, so that it can be limited to the actual procurement of current weather information, fueling and pre-flighting the airplane, and the provision and checking of appropriate equipment and aids. The filing of a VFR flight plan including flight following service should be at least simulated.

Use of the Compass

This exercise should be practiced with the directional gyro caged. Assigned compass headings should be established and held for moderate periods of time, and heading changes of from 5° to 30° should be practiced, using only the magnetic compass for a heading reference. Turning errors should be noted in moderately banked turns of at least 360° in each direction.

Chart Reading

Positive identification of position should be established by reference to information depicted on Sectional Aeronautical Charts, without the use of radio aids. This can best be practiced at altitudes below 1,000 feet to limit the area which the trainee can scan for check points. He should also be required to identify and find specific features indicated on the chart, such as quarries, towers, drive-in theaters, etc.

VFR Radio Navigation

No IFR radio orientation problems need be required; however, trainees should be able to establish and follow OMNI bearings, home and track on ADF bearings (if available in the airplane used), and establish fixes on a known track by cross bearings. How to find the necessary frequencies, tuning, and identification of radio facilities should be emphasized.

Control by Reference to Flight Instruments

The trainee's competence to control an airplane in flight by reference to flight instruments should be reviewed. Flight operations performed by sole reference to instruments should include straight and level flight, medium turns, climbs, descents, and recovery to straight and laterally level flight from unusual attitudes such as the beginning of a power spiral. This training must be performed in an airplane equipped with dual controls, and with a qualified safety pilot at the second set of flight controls.

Directed Practice

The instructor may direct his trainee to review and practice all maneuvers and procedures covered in the refresher course, in preparation for the final course check. He should be directed to pay special attention to operations on which further practice and instruction was found necessary during the course.

Competency Flight Check

Each trainee should receive a comprehensive flight check covering all operations reviewed during his pilot refresher course. Check procedures and standards should be at least equivalent to those prescribed for pilot certification flight tests in the appropriate FAA *Flight Test Guide*. These checks should be conducted and evaluated by an alternate instructor participating in the refresher course, or by the chief instructor designated for the event.

Trainees who meet the prescribed standards for this flight check may be certified as having successfully completed the Pilot Refresher Course prescribed by this Advisory Circular.

SYLLABUS FOR INSTRUMENT PILOT REFRESHER COURSE

A syllabus tabulating the training recommended for an instrument pilot refresher course is shown in figure 2. It provides the instrument experience requirements of the Regulations for IFR (instrument flight rules) flight operations.

Figure 2. Syllabus for Instrument Pilot Refresher Course

Ground Instruction	Flight Instruction	Directed Practice
<p style="text-align: center;"><i>Period 1</i></p> <ol style="list-style-type: none"> 1. Instrument training maneuvers. 2. Charts and approach plates. 3. Flight planning. 4. Equipment requirements. 	<p style="text-align: center;"><i>Lesson 1</i></p> <ol style="list-style-type: none"> 1. Instrument training maneuvers. 2. Emergency use of primary instruments. 	<p style="text-align: center;"><i>1 hour</i></p> <p>Practice as assigned—airplane or ground trainer.</p>
<p style="text-align: center;"><i>Period 2</i></p> <ol style="list-style-type: none"> 1. Use of VORs. 2. Use of ADF. 3. The ILS. 4. Radar vectors. 5. DME, Doppler, transponders, RADAR, etc. 	<p style="text-align: center;"><i>Lesson 2</i></p> <ol style="list-style-type: none"> 1. OMNI bearings. 2. ADF bearings and tracking. 3. IFR clearances. 4. Position reports. 	<p style="text-align: center;"><i>1 hour</i></p> <p>Practice as assigned—airplane or ground trainer.</p>
<p style="text-align: center;"><i>Period 3</i></p> <ol style="list-style-type: none"> 1. FAR and Regs. of the Administrator. 2. FIM and Airman's Guide. 3. Flight plans and clearances. 4. Preferred routes and SIDs. 5. Holding procedures. 	<p style="text-align: center;"><i>Lesson 3</i></p> <ol style="list-style-type: none"> 1. Standard instrument approaches : VOR ADF ILS RADAR 2. Missed approaches. 3. Holding patterns. 	<p style="text-align: center;"><i>1 hour</i></p> <p>Practice as assigned—airplane or ground trainer.</p>
<p style="text-align: center;"><i>Period 4</i></p> <ol style="list-style-type: none"> 1. Weather reports and forecasts. 2. Weather recognition. 3. Instrument emergencies. 	<p style="text-align: center;"><i>Lesson 4</i></p> <p>Cross-country flight under simulated IFR conditions, with three standard instrument approaches.</p>	<hr style="border: none; border-top: 1px dashed black;"/>

Modification of Syllabus to Suit Circumstances

The syllabus for the Instrument Pilot Refresher Course prescribes the minimum coverage. It is appropriate for refresher training only, and does not provide for the coverage of unfamiliar operations, such as the use of the ILS system, unless the appropriate segments of the course are expanded.

Ground instruction "periods" and flight "lessons" are specified in terms of the training to be covered, without reference to the time devoted to each. It is not contemplated that the course could be completed in less than the 6 hours of instrument time needed to meet the recent instrument experience requirement of the Regulations for the exercise of instrument rating privileges.

This course may be offered privately or at pilot training clinics of various duration. It is not considered feasible to attempt it in less than 2 days, and it may be effectively extended for as long as a week. For longer courses, it is recommended that the syllabus be extended by allotting more time to each training item covered, rather than by the introduction of additional subjects.

There is no objection, however, to the addition or introduction of other subjects *provided* the course retains its basic scope, format, and coordination of ground and flight instruction.

Use of Pilot Ground Trainer

The use of good ground instruments trainers for the directed practice listed in the course syllabus is encouraged. Training and practice with such devices should be under the direction of a certificated ground instructor with an Instructor Ground Instructor rating, a rated Instrument Flight Instructor, or a certificated Link Trainer Operator.

Portions of the flight instruction required by the syllabus may be conducted in ground trainers, *provided* all instrument flight maneuvers specified in Lesson 1 and the cross-country flight specified in Lesson 4 are conducted in actual flight under simulated or actual IFR conditions.

REFRESHER GROUND INSTRUCTION FOR INSTRUMENT PILOTS

Instrument Flying

Instrument Flight Training Maneuvers

This should consist of a review of the purpose and performance of each of the common instrument flight training maneuvers. It is recommended that this item should be presented by an instrument flight instructor who is instructing in the refresher course, unless the ground instructor is also a rated instrument flight instructor. In the interest of the consistency of ground and flight training, flight instructors assigned to the instrument refresher course should attend at least the first ground school period.

Use of Charts and Approach Plates

The procurement, filing, and use of Enroute Altitude Charts, Instrument Approach Procedure Charts, and Low Altitude Area Charts should be reviewed. The Coast and Geodetic Survey Charts may be used, or one of the standard commercial series of such charts. The revision procedure and schedules for such charts should be emphasized.

Instrument Flight Planning

The selection of routes and alternate routes, preparation of flight logs, and the selection of necessary documents and equipment for IFR flights should be covered.

Equipment Requirements for IFR Flight

This item includes a review of the aircraft and pilot equipment required for IFR operations, including instrumentation, communications and navigation radio, and Omni accuracy checks.

Radio Navigation Procedures

Use of VORs

The use of omnidirectional radio ranges for bearings, tracking, and the interception of desired courses should be covered. The use of cross-bearings for position fixes should be emphasized.

Use of ADF

The use of ADF for homing, tracking to and from a station, intercepting desired ADF bearings, and for cross-bearings to fix position should be covered.

ILS Approaches

The elements and the use of the ILS approach system should be reviewed. Use of the throttle to maintain the glide slope should be emphasized.

Radar Vectors

The use of RADAR vectors for departures, approaches, and for monitoring ILS approaches should be covered. Procedures for requesting RADAR assistance should be reviewed.

Introduction to DME, Doppler, Transponders, Radar

Although some of the trainees may have or be familiar with some of these systems, they are mostly new to general aviation. A short presentation of their functions, principles of operation, and limitations should be provided by an instructor or technician well informed on these types of airborne equipment.

Regulations and Enroute Procedures

Federal Aviation Regulations

This segment of the ground instruction should cover the portions of the Federal Aviation Regulations which apply to IFR operations. In addition, although it is not necessary that these be studied for content, trainees should be familiar with what is contained in "Special Air Traffic Rules and Airport Traffic Patterns" (FAR, Part 93), "IFR Altitudes" (FAR, Part 95), "Standard Instrument Approach Procedures" (FAR, Part 97), and "Security Control of Air Traffic" (FAR, Part 99), as applicable to instrument flight.

Flight Information Manual and Airman's Guide

The contents of the *Flight Information Manual* and *Airman's Guide* which are important to instrument flight operations should be reviewed.

IFR Flight Plans and Clearances

This part of the ground instruction should cover the required content of IFR flight plan, and the procedures for wording, filing, and delivery of IFR clearances. If desired, the use of "shorthand" symbols for the transcription of clearances may be covered.

Preferred Routes and Standard Instrument Departures

The importance and use of preferred routes and standard instrument departures (SIDs) should be reviewed. Their depiction on the Low Altitude Area Charts and use in filing flight plans should be covered.

Holding Procedures

The new standard holding procedure entries should be thoroughly reviewed.

Meteorology and Emergency Procedures

Weather Reports and Forecasts

This should cover the aeronautical weather reports and forecasts available to instrument pilots, and how they may normally be obtained. The pilot-to-forecaster service now being extended throughout the country should be introduced.

Weather Recognition

This is a review of the characteristics of significant weather situations of importance to instrument pilots. The relation of observed weather to forecasts received should be emphasized, as should the required pilot reports of unforecast weather encountered enroute.

IFR Emergencies

The pilot's responsibility for emergency action, radio and instrument failure procedures, icing, and deteriorating weather emergencies should be covered.

REFRESHER FLIGHT INSTRUCTION FOR INSTRUMENT PILOTS

Instrument Flying

The first flight lesson in the instrument pilot refresher course should be a review of basic instrument flying, including the emergency use of the primary flight instruments.

Instrument Training Maneuvers

Standard primary instrument flight training maneuvers, such as turns, slow flight, standard climbs and descents, recovery from unusual flight attitudes, and practice patterns should be reviewed. Any weaknesses or deficiencies in pilot response to instrument indications should be corrected and practiced before continuing to the IFR operations portions of the course.

Emergency Use of Primary Instruments

The use of the "needle, ball, and airspeed" for the control and maneuvering of the airplane should be reviewed. This should include straight and level flight, turns, climbs, descents, timed turns, slow flight, steep turns, and recoveries from unusual attitudes. The objective is not so much to develop precision as it is to demonstrate confidence and the assurance of ability to control an airplane in emergencies.

Directed Practice

The instructor may, at his discretion, direct his trainee to practice specified maneuvers and procedures covered on the first flight lesson. This may be done in an airplane with a competent safety pilot, or in a pilot ground trainer (Link, etc.) operated by an Instrument Ground Instructor, Instrument Flight Instructor, or a Link Trainer Operator.

Radio Navigation

The second lesson should begin only after the trainee has demonstrated adequate competency in all maneuvers and procedures covered in the first lesson. In the event directed practice has been assigned after the first lesson, the maneuvers practiced should be reviewed by the instructor before the second lesson begins.

Omni Bearings and Tracking

The use of OMNI bearings for orientation, position fixes, and homing should be reviewed. Tracking to and from VOR stations and the interception and tracking of desired radials should be emphasized.

ADF Bearings and Tracking

The use of ADF bearings for position fixes and homing should be covered. Tracking on ADF bearings should be covered, as should the interception of desired ADF courses.

IFR Clearances

During this lesson, IFR clearances should be requested and accepted by radio, or simulated, including read-back and transcription. Such clearances should be obtained from the appropriate FAA facility or simulated for each subsequent flight during the refresher course. All clearances and clearance amendments should be transcribed and read back in accordance with recommended procedures.

Position Reports

During the practice of radio navigation procedures, position reports should be delivered to the appropriate FAA facility or simulated (just as for actual IFR flights), each time an assigned radio fix is established.

Directed Practice

The instructor may direct his trainee to practice specified maneuvers and procedures covered during the flight lesson. The trainee may do this in an airplane with a qualified safety pilot, or in a pilot ground trainer operated by an Instrument Ground Instructor, an Instrument Flight Instructor, or a Link Trainer Operator.

Standard Instrument Approaches

The trainee should practice as many of the following types of standard instrument approaches as are possible with the aircraft equipment, and the available facilities will permit. (Low-frequency range approaches may be included at the instructor's discretion, but need not be required as a portion of the recommended Instrument Pilot Refresher Course.)

VOR.

ILS.—Localizer approaches may be practiced in airplanes which are not equipped with glide slope receivers.

ADF.

RADAR.—Radar monitored ILS approaches may be practiced in conjunction with the demonstrations of ILS approaches, and GCA approaches may be practiced where facilities provide this service.

Missed Approach Procedures.—The missed approach procedure prescribed for each type of approach practiced should be demonstrated.

Directed Practice.—The instructor may direct his trainee to practice specified procedures covered during the flight lesson. This may be done in an airplane with a qualified safety pilot, or in a pilot ground trainer operated by an Instrument Ground Instructor, an Instrument Flight Instructor, or a Link Trainer Operator.

Cross-Country Instrument Flight

The cross-country flight should be made under an IFR flight plan under actual or simulated IFR conditions. It should cover a triangular course on Federal airways, and involve approximately 3 hours of instrument flying. Standard instrument approaches should be practiced at three different locations, preferably using different approach systems.

The cross-country flight should not be undertaken until the trainee has demonstrated his proficiency in all other maneuvers and procedures covered by the refresher course. Another trainee may ride as observer during the cross-country flight, but should not participate in the planning or conduct of the flight.

For graduation from the recommended Instrument Pilot Refresher Course, the trainee's performance on the cross-country flight should meet the standards prescribed for an instrument rating flight test in the *FAA Instrument Pilot Flight Test Guide*.

FLIGHT INSTRUCTORS' ENDORSEMENTS AND GRADUATION CERTIFICATES

Logbook Entries

The flight instructor should enter and certify each period of flight instruction in the logbook of his trainee.

The flight instructor may certify in his trainee's logbook the satisfactory completion of the pilot refresher course outlined in this advisory circular as follows:

**FAA PILOT REFRESHER COURSE OUTLINED IN AC 61-10
SATISFACTORILY COMPLETED 1/21/64.**

/s/ JACK MOSLEY, CFI 1234-56

**FAA MULTIENGINE REFRESHER COURSE OUTLINED IN
AC 61-10 SATISFACTORILY COMPLETED 1/21/64.**

/s/ JACK MOSLEY, CFI 1234-56

**FAA INSTRUMENT PILOT REFRESHER COURSE OUTLINED
IN AC 61-10 SATISFACTORILY COMPLETED 1/24/64.**

/s/ JACK MOSLEY, CFI 1234-56

Graduation Certificate

An agency or organization that conducts or sponsors a pilot refresher course may issue graduation certificates to graduates of the course. Figure 3 is a sample to follow for such graduation certificate.

Figure 3. Sample for a graduation certificate.

ASSOCIATED FLYING CLUBS

Chicago, R. I.

CERTIFICATE OF GRADUATION

This is to certify that

has graduated from the FAA pilot Refresher Course
at the annual Associated Flying Club pilot training
clinic at Chicago, Rhode Island.

Date of Graduation

Given under my hand and seal this

____ day of _____ 19____

Signature

Title

* U. S. GOVERNMENT PRINTING OFFICE : 1964 O - 737-953